REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	7/15/97	Quarterly Status 3/6/97 - 7/15/97

4. TITLE AND SUBTITLE

Computational Models of Human Organization Dynamics
Quarterly Status Report #1

5. FUNDING NUMBERS

A1 9760400.1320 E495
P6S10 2525 DPAC 6 5219
503733

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COD - 1

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

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10. SPONSORING / MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION / AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited.

12b. DISTRIBUTION CODE

A

13. ABSTRACT *(Maximum 200 words)*

14. SUBJECT TERMS

Organizational Dynamics

15. NUMBER OF PAGES

4

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	UL

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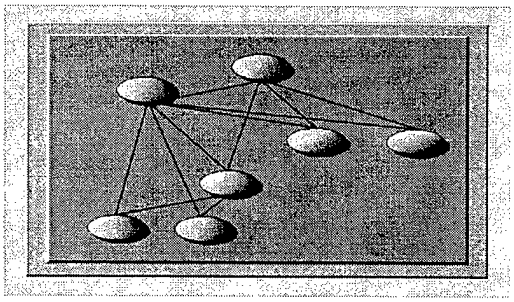

Computational Models of Human Organization Dynamics

Quarterly Report #1

Sponsored by
Defense Advanced Research Projects Agency
Information Systems Office
Computational Models of Human Organization Dynamics
ARPA Order No. E495
Program Code No. 6S10
Issued by DARPA/CMO under Contract #MDA972-97-C-0001

Period Covered: 3/6/97 – 7/15/97

Reporting Period

This is the first quarterly report for the project: Computational Models of Human Organization Dynamics. The contract start date was 3/6/97, and we began work that day. This report covers the period from 3/6/97 through 7/15/97.

Progress During Reporting Period

During this project period we have made significant progress on the design of the ACCORD organizational dynamics simulation software. We have exploited research conducted by Drs. Fehling and Courand that has produced a "Generative Theory of Social Dynamics" (GTSD). This theory, in its ultimate algebraic form, provides a mathematically rigorous statement of the concepts and relationships embodied in ACCORD.

GTSD also provides a foundation for the methodology, called Practice Mapping, which provides a structured set of steps to undertake in the lifecycle of a modeling effort. By "life-cycle" we mean that simulation studies occur within the larger programme of gathering data on organizational practices (e.g., through participant-observation, interviews, and other field-observation methods), then implementing a computational model of the organization's practices, and then carrying out experiments with this ACCORD model. These experiments are expected to lead back to the organization's practices in the form of additional mapping studies as well as interventions to improve practices -- thereby completing a cycle.

In keeping with this life-cycle view of simulation methodology, we have begun design and development of several adjunct computational tools that support such activities as archiving structural descriptions of organizational practices, obtained through Practice Mapping. We are also developing computational tools to support model implementation -- transforming the descriptions of an organization obtained from Practice Mapping into an executable ACCORD model.

We have a nearly complete formulation of the specifications and requirements for ACCORD's simulation engine, a preemptive, prioritizing scheduler and interpreter for executing an ACCORD model as a kind of discrete-event simulation.

Finally, we have begun design of a suite of tools to be used to craft and carry out experiments using an ACCORD model. This suite will include analysis and visualization tools so that a modeler can form and test hypotheses above the level of directly-collected simulation data.

Plans for Next Quarter

We plan to place the majority of our emphasis on the continued development of the computational tools just described. In addition to this, we will develop a suitable demonstration

example that we can use to illustrate organizational modeling, using these tools within our life-cycle conception of simulation. We hope to be able to present this demonstration toward the end of the second quarter.

Equipment Purchases

We have purchased two DEC workstations, a 433au and a 500au, as development platforms for this project. These workstations are entirely dedicated to this project.

Personnel Matters

There have been no changes in the key personnel proposed for this project (Drs. Fehling and Courand). And, we have been able to hire two software developers of very high caliber to work on this project.

Meetings, Important Exchanges and Decisions

There have been no meetings with DARPA representatives during the reporting period. The one interchange of possible note was the notice Dr. Flank gave us, through an e-mail exchange, that there is somewhat greater flexibility (than we originally thought) in when we demonstrate our developing simulation capability.

Problems

We have no problems to report at this time. We foresee no substantial risks to our ability to complete this project successfully, on time, and on budget.

Related Accomplishments

We have a contract with a local municipality to help develop requirements for a future project to develop a new general plan for the city. We are viewing the city as a multi-organizational social system. Municipal planning entails a (possibly surprising) amount of crisis response, and as such an organizational view provides a powerful structuring framework. In any case, this project is affording us the chance to test GTSD and Practice Mapping in a non-military domain.

Fiscal Status

The following table presents the fiscal status for this project.

Amount Currently Provided" $374,813.	
Expenditures and Commitments to Date	$112832.
Manhours Planned, Actual	planned = 1066, actual = 1003
Estimated Funds/Qtr to Complete Work	$90K, $90K, $81.9K
Estimated Date of Completion	2/28/98

Distribution of this Report

The following individuals/organizations comprise the distribution list for quarterly reports on this contract.

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